



Improving Power Plant  
Efficiency and Extending  
Equipment Life





## COMMITTED TO YOUR SUCCESS

Don't compromise on your power plant's performance and reliability—choose an analytical instrumentation supplier 100% committed to your success. At Honeywell, we've spent years developing products, services and maintenance solutions geared to the power generation industry. Since we understand the demands of modern power plants, we deliver safer, more effective ways to optimize your processes.

# Safe and Effective Ways to Optimize your Processes

Best of all, Honeywell's smart sensors and analytical instruments are available from authorized distributors throughout the world. Knowledgeable analytical professionals are there to assist you—when and where you need them.

## Less Downtime—More Production Uptime

Throughout the power generation industry, improving operating efficiency and maximizing equipment life have always been critical, but never so much as today. Many power plant shutdowns can be attributed to water impurities and other cycle chemistry problems. Each shutdown costs a plant millions of dollars, so ignoring the proper measurements in a water treatment program is not an option.

With so much at stake in your operation, you need a partner who can deliver the best analytical technology quickly and cost-effectively, and apply proven power industry experience to provide a solution to meet your specific needs.

## The Right Partner to Help You Prosper

Producing maximum power from your generation plant, whether it's a fossil, co-gen or nuclear facility, requires a partner who can deliver the right measurement and control products, systems and services. That's Honeywell.

With a long power industry background, Honeywell has the qualifications to help enable your plant's prosperity. Our team of field sales engineers, local stocking representatives, and technical support specialists are available to serve you in key locations around the world. We back all of our products with a comprehensive warranty and a Technical Assistance Center staffed with engineers and technicians with solid product knowledge.



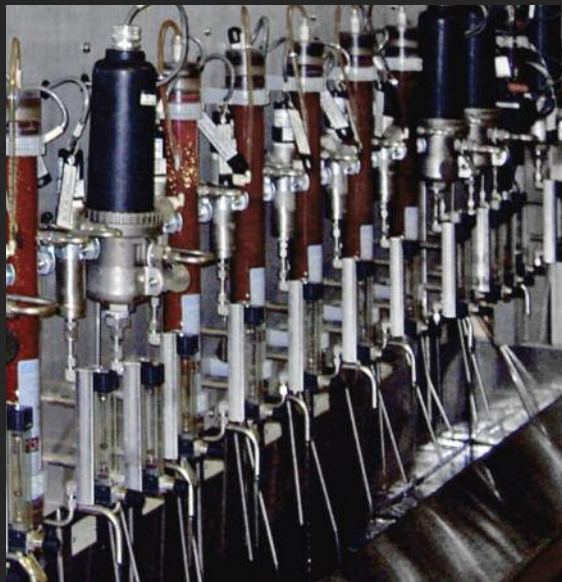
### Honeywell Analytical Applications include:

- Boiler Feedwater Quality
- Cooling Water Quality
- Wastewater Treatment
- Hydrogen Cooled Generator Safety and Efficiency



# Measurement Solutions Across Your Plant

With fewer personnel available to oversee power plant cycle chemistry, greater reliance on on-line instrumentation is a necessity. For plant owners and operators, Honeywell's advanced analytical technology provides measurements helping protect valuable capital equipment and piping, while safeguarding facilities and personnel. It also enables you to optimize chemical reagent usage, increase thermal efficiency, maximize power production uptime, and meet strict regulatory requirements.



## Boiler Feedwater Quality

During power plant boiler operation, the evaporation of steam leaves behind an increasing concentration of corrosive minerals in the water. Maintaining high-purity water in the boiler water cycle reduces corrosion and scaling, which is frequently the cause of leaks, boiler tube failures, unscheduled outages and expensive repairs.

In boiler feedwater applications, conductivity, pH, and dissolved oxygen must be measured on a continuous basis to ensure requirements for water entering the boiler are met.

## Cooling Water Quality

A properly maintained cooling tower is essential for providing cooling water to heat exchangers used in condensers, sample lines and other critical power plant systems. Even though water from cooling towers is usually separate from water in the boiler cycle, proper cycle chemistry is just as important to heat exchange efficiency. Optimal water quality is necessary to reduce scaling, corrosion and biological growth in cooling systems.



### Wastewater Treatment

Many power plants are now being designed for zero discharge. Water, whether from boiler or cooling tower blowdown, will in some way be recirculated — usually to the makeup water treatment system for the boiler cycle or occasionally for the cooling tower. If zero discharge is the goal, this recirculated water must be monitored on a continual basis to determine its pH and dissolved oxygen characteristics.



### Hydrogen Cooled Generator Safety and Efficiency

Using hydrogen gas to cool a generator can increase its efficiency and save operating costs. But hydrogen gas mixed with air in certain concentrations is very explosive. It is very important to ensure that those concentrations do not exist in the start-up and normal operation of the hydrogen cooled generator. Reliable hydrogen gas concentration measurement provides a safe environment and prevents accidents.



Industry proven field instruments that set the standard for performance and reliability, providing the safety, security and efficiency required by the most demanding applications. Honeywell has a proven track record of reducing risk, avoiding downtime and providing customers with long-term support and migration paths.

# Honeywell Solutions

## Durafet pH Electrodes

Durafet pH electrodes use a non-glass, Ion Sensitive Field Effect Transistor (ISFET) sensor. They are virtually unbreakable, reducing replacement costs. The stable ISFET sensor design results in less frequent calibrations—saving maintenance costs. The Durafet electrode's fast response (up to 10X faster than traditional glass electrodes) minimizes chemical usage and lowers reagent costs.

- Rugged ISFET sensor minimizes breakage and replacements
- Variety of mountings to make installation quick and easy
- Durable Ryton body to withstand most process environments
- Quick-disconnect cables eliminate re-wiring replacements



## UDA2182

The innovative UDA2182 Universal Dual Analyzer provides the most versatile and flexible multiple-input analyzer platform on the market for measurement of pH, ORP, conductivity and dissolved oxygen. Its easy-to-configure set-up, with measurement-specific, menu-driven prompts and simple operation, gets you started quickly.

- Versatile and flexible mix-n-match dual input
- Easy-to-read process information on at-a-glance display
- Optional calculated pH and CO<sub>2</sub> concentration algorithms
- PID control option
- Multiple local language options
- Hassle-free retrofits for legacy Honeywell instruments
- Ethernet/Modbus communication option



## HB Series pH Electrodes

Honeywell's HB Series Electrode Mountings are designed for harsh applications such as wet scrubbers. The unique reference electrode design resists poisoning and reference junction fouling.

- Variety of mountings to make installation quick and easy
- Chemically-resistant body options—CPVC, Kynar and Polypropylene
- Temperature sensor options compatible with most analytical instruments

### Toroidal Conductivity Sensors

The 5000TC Toroidal (Electrodeless) Conductivity Sensors measure the conductivity of solutions from 0.2 to 2000 millisiemens/cm. The sensors can also be used for monitoring chemical concentration and salinity. These corrosion and fouling-resistant cells are available with a choice of mounting assemblies to ensure compatibility for a wide variety of applications.

- Variety of material types to meet most application requirements—PEEK, PFA, Teflon®, PVDF, and Polypropylene
- Increased cell reliability due to high chemical resistance and low friction factor in the materials of construction
- Flexibility of installations with four mounting types—submersion, union mount, insertion/removal, and sanitary

### Hydrogen Purity Analyzer

The 7866 Triple Range Gas Analyzer reliably measures gas concentrations during start-up and normal operation of hydrogen cooled generators to prevent explosive environments. The analyzer consists of a thermal conductivity sensor and control unit.

- Over 40 years of reliable and safe operation
- Measures three ranges—CO<sub>2</sub> in air, H<sub>2</sub> in CO<sub>2</sub> and H<sub>2</sub> in air—with one analyzer
- Factory configured for the three ranges simplifies set-up
- Approved for Class I, Div 1 hazardous areas
- Sample panel option makes installation quick and easy



### Contacting Conductivity Cells

A complete line of conductivity cells and instruments help measure, analyze and transmit valuable conductivity, resistivity and concentration information in all types of industrial process applications—from ultra-pure water up to acid/base concentrations.

- In-line, submersion, flow-thru and ball valve mountings to meet installation requirements
- Automatic upload of cell information eliminates set-up errors
- Quick-disconnect and junction box options for easy wiring
- Variety of cell and body materials to meet a wide range of applications

### Dissolved Oxygen Probes

Honeywell's DL5000 Dissolved Oxygen Probe is based on a unique and patented equilibrium probe technology that is accurate, reliable and maintenance-free. The DL5000 is a no-internal maintenance probe independent of process flow and fouling.

- ppb or ppm measurement
- Reduced maintenance costs—no periodic replacement of anode or electrolyte
- Heavy-duty membrane—eliminates replacement requirements
- Quick-disconnect option reduces replacement time
- Submersion, in-line or flow-through mountings to meet a wide variety of installations

### HPW7000 High Purity Water System

The HPW7000 High Purity Water Measurement System is an electrode mounting assembly designed specifically for difficult pH and ORP measurements in high-purity water applications. The system's special flow chamber and electrode mounting simplifies installation and calibration while providing a pH or ORP measurement that is unsurpassed in accuracy and stability.

- Reliable, application-specific flow chamber
- Compact design for easy, quick installation
- Low-maintenance flowing reference system
- Guaranteed accuracy and stability

**For More Information**

To learn more about Honeywell's Analytical Products, visit [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your local Honeywell account manager.

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